

# Knowledge and Attitude of Teachers in Selected Malaysian Primary School towards Dental Injuries

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## ABSTRACT

*To ascertain the level of knowledge among primary school teachers towards the management of traumatic dental injuries (TDIs) in school and to determine the preference among teachers regarding the education tools that can be used to increase awareness and knowledge among them. A total of 150 teachers from primary schools in three different districts were included in the study and they were given self-administered questionnaires to be filled. The validated questionnaire was distributed randomly in the selected schools. The questionnaire included two scenarios comprising of tooth fracture and avulsion. Questions regarding awareness and management of these scenarios were asked. All 150 participants answered the questionnaire; of these 74% were females 26% were males. 64% of the participants had received tertiary education. Although 70% of teachers had obtained first aid training, only 9.3% of them had received training regarding dental injuries. About 53% of participants knew the correct answer for the appropriate response to fractured tooth and only 35.3% managed to correctly answer the question related to appropriate response to an avulsed tooth. Only 38.7% knew about appropriate rinsing solution and a mere 4.7% were familiar with proper storage media. Even though the teachers have poor knowledge regarding management of dental injuries, it is reassuring to know that 93% of them are keen on further training and awareness. More educational programmes need to be introduced to empower the teachers with the relevant knowledge required to deal with dental emergencies.*

**Keywords:** *children, dental trauma, emergency, knowledge, teacher meat*

## INTRODUCTION

Traumatic dental injuries are a serious dental public health concern as the rising number of cases can challenge the core problems of caries and periodontal problems [1,2]. Dental trauma is considered a major public health problem as the injuries can affect one's quality of life [3]. It has been well documented that majority of dental injuries among children occur at home and at school [4]. It is reported that dental injuries affect approximately one out of five children in school [5-8] and the age group most susceptible is between 8-12 years old [9-12].

Among common causes of dental trauma in school going children include falls, blows to the face and sports activities [13,14]. The resulting trauma ranges from concussions to maxillofacial injuries. Traumatic dental injuries include concussion, luxation, intrusion, extrusion and avulsion of a tooth. Crown fracture makes up between 26 -76% of the injuries [16], while 30-44% are luxative injuries [17]. Tooth avulsion can contribute up to 16% of traumatic dental injuries that occur at school [18]. Unfortunately, tooth avulsion is a complicated affair with frequent and long duration of treatment. This injury has a peak incidence between the ages of 7-11 years old with the maxillary central incisors being the most affected [19]. Avulsion is more common in this age group rather than adults and this is due to the nature of loose periodontal ligament around the teeth and the presence of more cancellous bone [20].

The immediate steps taken to manage an avulsed tooth determines its prognosis and if done properly, the success rate can be as high as 85 to 97% [9]. For a favourable outcome, the duration between the time of avulsion and replantation must be within the first 15- 20 minutes [22]. The manner of handling the tooth determines the success of a tooth replantation procedure. The storage mediums which can be used to transport an avulsed tooth are Hank's balanced salt solution, saliva, milk, vestibule of the mouth, normal saline, or water [23]. The ideal storage medium depends on the composition and osmolarity to maintain the cells viability. Hanks balanced salt solution has superior ability to keep the cells viable, but it is not easily available in Malaysia [23].

As accidents frequently happen within the school compound, the immediate steps taken and the appropriate management by teachers will determine how long the tooth will survive and if it can be replanted [12]. School teachers frequently deal with traumatic dental injury at schools, but studies indicate that they lack knowledge in the management of dental trauma [18].

In a study done by Bayrak *et al.* (2012) [24] in Turkey to evaluate the school teachers' knowledge and attitude to emergency management of dental injuries, 45.5% of the teachers gave wrong answers regarding emergency management of avulsion case and almost one third of the teachers did not know what to do in such incident. In a similar study done by Mohammad Al-Obaida (2010) [19] in a group of Saudi primary school teachers, 35.3% of the teachers managed to identify the tooth as a permanent incisor, but 55.2% gave wrong response regarding emergency management. Alarmingly, 98.2% of the subjects chose the wrong medium to transport the tooth. Mori *et al.* (2007) evaluated the knowledge of tooth avulsion of school teachers in Brazil and the findings showed that 75% of the teachers demonstrated that they would not replant the tooth [25]. In a Senegal study, 49.1% of the teachers chose to systematically rinse the avulsed tooth. However, their choice of solution reflected their poor knowledge as they picked salt water (20.4%), antiseptics (13.9%) and dentrifices (13.6%) over tap water[26].

Dental injuries mark a long journey for the patients and attending dentist alike. Review appointment are necessary and warranted as some complications can only be seen many months or years post trauma. In severe cases, traumatic dental injuries can cause pulp damage and injuries to the periodontal ligament which can both lead to tooth loss. Management of traumatised teeth should be done immediately and appropriately for long term success. Many studies around the world have shown the lack of knowledge of school teachers with regard to emergency management of traumatic dental injuries [27]. However, there is no study evaluating the knowledge and attitude of school teachers on dental trauma management have been done in Malaysia.

## MATERIALS AND METHODS

This study was approved by the Universiti Teknologi MARA's ethics committee (600- RMI 5/1/6). The study is a cross sectional questionnaire study conducted among 150 primary school teachers in ten schools in three different districts, Shah Alam, Muar and Tumpat. Expert review of the questionnaire was done to ensure content validity and necessary modifications were made accordingly, wherever applicable.

The questionnaires were modelled based on previous surveys done in Turkey (Byrak *et al.*, 2012), Jordan (Al-Jundi *et al.*, 2005), Israel (Axia Fux-Noy *et al.*, 2010) and Iran (Mesgarzadeh *et al.*, 2009) [18, 24, 27-28]. The questions were condensed into 20 items covering the aspects of knowledge and attitude.

The questionnaire was divided into three major parts. The first part included demographic details and experience of the teachers. The second part of the questionnaire consisted of questions assessing subjects' knowledge regarding dental trauma and immediate management options. The respondents were given two case scenarios which were fractured permanent tooth and tooth avulsion and related questions were asked. The third part contained questions on the teachers' satisfaction on the current level of knowledge regarding emergency management of dental injuries, ability to handle dental emergency in school. The respondents were also asked what method would be the best to increase their knowledge of dental trauma.

The questionnaire was personally distributed among the teachers by the researchers. The consent and approval was obtained from the Director of District of Education and headmasters of schools involved. The study was explained to the volunteered respondents beforehand and they were asked to assemble at a common venue in the school at their convenience. Written consent was obtained and all the respondents were assured of strict confidentiality. The questionnaire was distributed to the respondents after giving instructions. Adequate time was given to the respondents to complete the forms. The forms were collected on the same day and it was ensured that the teachers did not use any external references such as books or the internet to obtain the answers.

The completed forms were compiled and the data was entered into MS excel sheet (Microsoft Corp.) and results was calculated and analysed using SPSS for Windows version 20.1. The chi square test was used to compare the result according to district, level of education and years of experience. Level of significance was set at  $p \leq 0.05$ .

## RESULTS

### Part I: Demographic Features

Around 200 teachers were approached and invited to participate in this study. Of these, only a total of 150 teachers were willing to answer the questionnaire. There were 50 respondents from each district which are Shah Alam, Muar, and Tumpat. All 150 filled questionnaires were included in the study as they were complete and fulfilled the criteria.

**Table 1: Distribution of respondents according to gender and age group**

Gender	%
Male	24
Female	76
<b>Age Group (years)</b>	
21-30	15.3
31-40	41.3
41-50	31.3
51-60	12.0

Majority of the respondents (74%) were females and two thirds of the subjects were between the ages of 31 to 50 years. Language teachers constitute the biggest group of respondents (41.3%), followed by Science, Mathematics and Technology (32.7%).

84 (56%) of the respondents had less than 15 years of teaching experience while 14% had more than 25 years of experience. The demographic profile indicates that 70% of the teachers had first aid training during their teachers training but only 14 (9.3%) were trained to deal with dental emergencies as part of their core training.

With regards to experience dealing with dental injury, only 18 (12%) teachers have dealt with at least one case of dental trauma while in service.

## Part II: Knowledge survey

### Scenario A:

The respondents were given a scenario of an eight years old boy who presented with a broken upper incisor and they were asked to identify whether the tooth was a deciduous or permanent tooth. A total of 74.5% of the respondents wrongly identified the tooth as a primary tooth while 12.6% of them answered that they did not know what type of tooth it was. This leaves another 12.9% of respondents who were able to identify the tooth correctly. Chi-square test shows a significant difference ( $p=0.000$ ) in the category of tooth identification in Scenario A. However, there was no significant difference noted when a chi-square analysis was done to determine the effect of gender, district, age group, level of education, subject of teaching and previous training in managing emergencies.

In relation to the most appropriate course of action to be taken by the teacher when facing a situation of fractured teeth, 53% of the respondents chose to contact the parents immediately and advise them to take the child to a dentist. Less than 10% chose to merely reassure the child and not inform the parents (Figure 1).

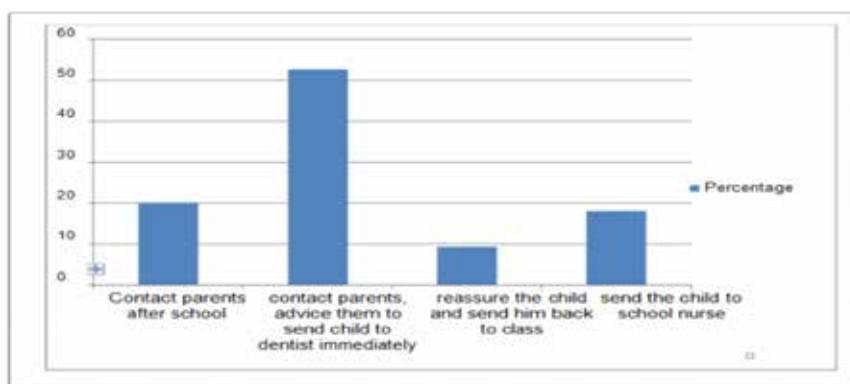


Figure 1: Immediate course of action taken by teachers in the event of fractured upper teeth in an eight years old

## Scenario B:

The second scenario presented a case of an avulsed upper incisor in a 12 year old girl. For emergency management, only six teachers (4%) responded ideally by attempting to replant the tooth. Majority of them (42.7%) chose to send the child to the nearest hospital.

Regarding the choice of rinsing solution, 66 respondents gave the wrong answer which is mouth-rinse solution, followed by 38% who chose tap water. For the best transport medium of the tooth, 31.3% chose salt water. A very small percentage answered correctly, seven out of 150 teachers (4.7%) chose milk, and four teachers (2.7%) answered saliva (Figure 3). A chi-square test done to assess the effect of age and experience on the knowledge regarding an avulsed permanent tooth showed no significant differences.

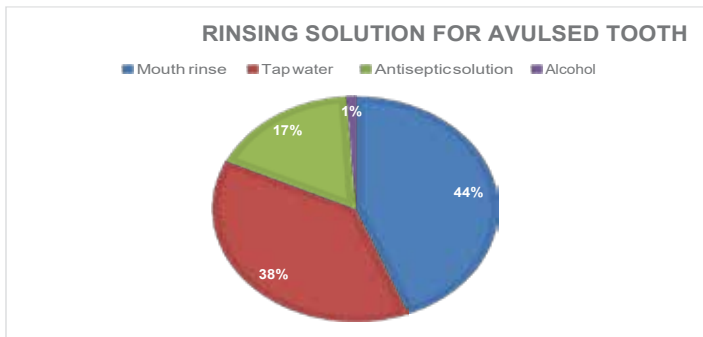


Figure 2: Preferred choice of rinsing solution for avulsed permanent tooth

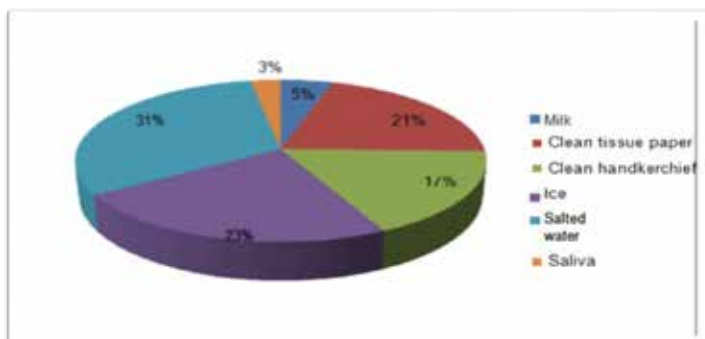
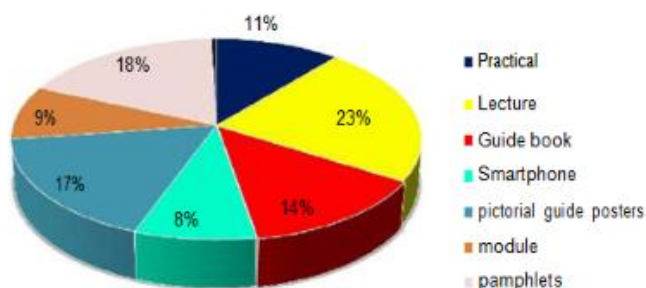


Figure 3: Preferred choice of transport medium for avulsed tooth

### Part III: Attitude survey

The responses to Part III of the questionnaire reflected self-assessed knowledge and their desire to have further education on dental injury. 84% of the teachers are not satisfied with their knowledge regarding emergency management of dental injuries. 83% felt that they are not able to handle a dental emergency in school adequately. With regard of further education, 96.7% answered positively that they need more knowledge and exposure regarding dental emergencies, with 93.3% (140 teachers) are interested to have more exposures and skills to deal with such cases. Figure 4 shows that traditional lectures on the topic of dental trauma is among the most preferred tools of gaining knowledge in dental trauma.



**Figure 4: Choice of tools to increase knowledge in dental trauma among teachers**

## DISCUSSION

It is imperative that school teachers have at least the basic knowledge to deal with dental trauma as school going children make up a large part of children suffering from injuries. The teacher's knowledge of TDI emergency management is fundamental to the provision of correct care to an injured child [29]. However, most teachers do not receive the necessary orientation related management of various trauma cases [2].

A large proportion (64%) of the teachers who participated in this questionnaire were qualified with tertiary education. This is especially important when taking into account the effect of teachers' educational



background on their knowledge regarding traumatic dental injury. However, our findings of knowledge and confidence does not correspond with findings from Mesgarzadeh *et al.* (2009) [28] which found that higher level of education and more experienced teachers were more capable of handling a dental injury in the right manner. In this study, there was no significant difference on the level of knowledge based level of education. Although most of the teachers received some form of training in emergency, only 9.3% of them received any training involving management of dental trauma. Our findings are consistent with previous studies in which primary school teachers reported that they received no training regarding dental trauma [28,29]. Surprisingly, among those who reported having received training regarding dental trauma, many failed to give the correct responses to the management of dental trauma, and this finding corroborates with a reported by Chan *et al.* (2001) [30]. This discrepancy could be due to the fact that the dental module in their training was inadequate. Another possibility is that the training may be forgotten due to the long duration after graduating as a teacher. To address this low level of knowledge, the Ministry of Education in Malaysia should consider making dental trauma education mandatory for primary school teachers.

In this study, 52.7% of the teachers would rightly contact parents in case of broken tooth and get them to go to a dentist. Reporting to the parents is the golden rule when it comes to dealing with any injury of a child in school. According to McIntyre *et al.* (2008) [31], teachers are unaware of which dentition is affected when an eight year old loses his tooth. The present study corroborates these findings, as 11.3% of them marked the broken tooth as a permanent tooth while 88.7% of them marked either primary tooth or unsure in response to the question addressing a broken central incisor in 8 years old boy.

As the prognosis of an avulsed tooth depends on the time lapse between injury and treatment, it is necessary for either the patient or someone else at the scene to re-implant the tooth immediately [25]. Furthermore, the survival and longevity of an avulsed tooth depends largely on appropriate handling of the tooth to ensure the viability of periodontal ligament cells which cover the root surface. The choice of irrigation for tooth cleansing, extra oral dry time, storage medium for the tooth and urgent attention by the dentist all greatly affect the prognosis of an avulsed tooth [12]. Unfortunately, only

4.0% of teachers recognised that an avulsed tooth should be placed in the socket immediately. This would be the best treatment option with the best long term prognosis [15]. In a study with monkeys, it was shown that the reimplanted teeth after two hours had more root resorption than after 18 minutes [12]. In a Singaporean study, the results showed that 71% of pre-school teachers there knew the treatment of avulsion [32].

Generally, teachers are not inclined to reposition the tooth in the socket themselves and thus may stem from a few reasons. The teachers feel that they lack the training and they feel they may inflict more pain for the child. The teachers also may be reluctant as they fear the spread of blood borne diseases and do not want to be responsible for complication which may arise or end up getting sued.

Teachers also gave greater priority to stopping the bleeding which was perceived by most as life threatening [34]. 35% of the teachers chose to send the child to the dentist with the avulsed tooth in liquid. The choice of a suitable medium and transportation within 30 minutes can yield good long term prognosis [31]. However, the teachers in this study revealed a lack of awareness regarding the best form of rinsing solution and storage media. Only 38.7% of them stated they would clean the avulsed tooth with tap water and another 61.3% chose wrong rinsing solution, with 44.0% of them stated they would clean the avulsed tooth with a mouth-rinse solution. They are unaware that they would be severely decreasing the success of the procedure. The majority of them would seek professional help immediately, but they would choose the wrong storage media, which would reduce the success rate. While 62% chose to put the avulsed tooth in liquid, only 4.7% knew the appropriate transport medium is milk, 2.7% chose saliva and 54.6% of them wrongly chose salt water and ice as storage media. This findings contradicts with those by Blakytyn *et al.* (2001) [33] and McIntyre *et al.* (2008) [31] with 45.6% and 34.0% respectively chose milk as the most suitable storage media.

Milk serves as an appropriate medium for avulsed tooth for up to three hours because of its optimum osmolarity and *pH* composition [35]. The wrong answer options included dry storage such as clean tissue paper and clean handkerchief. In a study by McIntyre *et al.* (2008) [31], 32.0% of teachers chose Hanks balanced salt solution (HBSS) as a storage media.

Hanks balanced salt solution has superior ability to keep the cells viable, but it is not easily accessible [23]. HBSS was not included in this present study as HBSS is not commercially available in Malaysia.

In present study, 84.0% of teachers agreed that they lack knowledge regarding emergency management of dental injuries and 82.7% admitted they were not able to handle any dental emergency in school. In line with worldwide research, the teachers in this study clearly lack adequate knowledge regarding the emergency management of avulsed tooth in a child [18, 25, 29, 20, 32, 33]. In the present study however, about 93.3% of them were interested in having more exposure and skills in dealing with dental emergencies in school.

Mori *et al.* (2007) carried out an educational campaign about dental trauma in the city of Adamantina, Brazil, and they had a successful outcome after educational campaigns as the school professionals were able to handle dental avulsion cases satisfactorily. This result shows that there is a great need for educational campaigns which can be applied for primary school teachers [25].

## CONCLUSION

The current status of knowledge regarding dental trauma is very poor among primary school teachers. This scenario needs to be improved if we hope to increase the chances of successfully replanting avulsed teeth. The subjects in this study are keen to update their knowledge and as such more educational programmes need to be introduced to empower the teachers with the relevant knowledge.

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